



**SPECIAL PROVISIONS
FOR
WATER MAIN**

**Johnson County
STP-U-3715(668)--70-52**

**Effective Date
May 18, 2021**

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

156173.01 SPECIAL REQUIREMENTS.

- A.** Testing shall not commence until all components are installed (including tracing system), and the as-built and material list are submitted to the Engineer. Testing (including tracing) should be completed within 2 weeks for each segment of water main installed. Segments will be no more than 1200 feet in length. Each segment will take approximately one week to complete bacteriological and pressure testing. The testing will likely occur over eight to ten segments sequentially.
- B.** All testing and system operations will be performed by the Contracting Authority.
- C.** Reuse of materials is not allowed unless approved by the Engineer. The Contracting Authority accepts no fault for any issues caused by, or related to, the reuse of any material.
- D.** The Contracting Authority maintains salvage rights to all fire hydrants designated as public.
- E.** Samples of water main and its appurtenances may also be retained by the Engineer for testing purposes.
- F.** Flushing devices (blowoffs) shall only be used on a temporary basis as approved by the Engineer.
- G.** The City of Iowa City Water Division, Accepted Products for Water Distribution Materials, should be followed for all water mains and appurtenances. This document is attached at the end of this Special Provision.

156173.02 STANDARD SPECIFICATION REVISIONS.

Make the following revisions to the Standard Specifications:

4150.02 PIPE AND FITTINGS.

A. Water Main.

2. Ductile Iron Pipe.

a. Minimum Thickness Class.

3) (ADD) Restrained Joints: Special thickness Class 53 according to AWWA C151.

B. Bolts for Water Main and Fittings.

2. Other Bolts and Nuts.

~~b. (DELETE) Ductile iron.~~

~~c. (DELETE) Zinc, zinc chromate, or cadmium plated.~~

C. Fittings.

1. DIP and PVC Pipe.

b. Joint Type.

~~1) (DELETE) For pipe sizes 16 inches and less, use mechanical joint complying with AWWA C111.~~

2) (REPLACE) For all pipe sizes, use restrained mechanical joint system. Provide follower gland using breakaway torque bolts to engage thrust restraint.

a) Minimum pressure rating same as connecting pipe. For fittings between dissimilar pipes, the minimum pressure rating is the lesser of the two pipes.

b) Suitable for buried service

c) Joint restraint to be field installable, field removeable, and re-installable.

3. Pipe Coupling.

d. Bolts and nuts. (REPLACE) High Strength, low alloy corrosion resistant steel or stainless steel.

D. Concrete Thrust Blocks.

3. (REPLACE) The use of concrete thrust blocks is not required due to all of the water main being constructed with restrained joints.

E. Pipeline Accessories.

2. Tracer System.

(REPLACE) Comply with Figures 5010.102 and 5010.103 in the plans.

d. Splice Kit: (REPLACE) See "Tracer Wire Connector" under the Accepted Products for Water Distribution Materials. This document is included as an attachment to this Special Provision.

F. Special Gaskets

1. (REPLACE) For soils contaminated with gasoline, use nitrile gaskets. Refer to the contract documents for specific locations where contaminated soil is known or likely. Use nitrile gripper gaskets where the water main is to be trenched. Use standard nitrile gaskets with CL53 RJIB DIP where the water main is to be installed with the trenchless method.

2. (REPLACE) For soils contaminated with volatile organic compounds, use nitrile gaskets. Refer to the contract documents for specific locations where contaminated soil is known or likely. Use nitrile gripper gaskets where the water main is to be trenched. Use standard nitrile gaskets with CL53 RJIB DIP where the water main is to be installed with the trenchless method.

4. (ADD) For soils not contaminated with gasoline or volatile organic compounds, or not specified otherwise in the contract documents, use styrene butadiene rubber (SBR) gaskets. Use SBR gripper gaskets where the water main is to be trenched. Use standard SBR gaskets with CL53 RJIB DIP where the water main is to be installed with the trenchless method.

G. Water Service Pipe and Appurtenances**1. Controlling Standards.**

(REPLACE) Jurisdictional policies and procedures, plumbing and fire codes.

4150.03 VALVES.**C. Butterfly Valves.**

1. **Standards:** (REPLACE) Comply with AWWA C504 class 150B (gray iron or ductile iron) or class 250B and NSF 61.

D. Tapping Valve Assemblies.**1. Tapping Valve.**

(REPLACE) Gate valve complying with AWWA C509.

4. Gasket.

~~c.~~ (DELETE) Use nitrile rubber.

4150.04 FIRE HYDRANT ASSEMBLY.**C. Features.**

4. **Hose Nozzles:** (REPLACE) Two, each 2 1/2 inches in diameter, caps attached to hydrant with chains.
5. **Direction of Opening:** (REPLACE) Clockwise, unless otherwise specified.
6. **Items to be Specified:** (REPLACE) The following items will be specified by the Jurisdiction or in the contract documents.
 - a. Operating nut: 1 1/2 inches, standard pentagon
 - b. Pumper nozzle: One 4 1/2 inch integral Storz connection with 1 1/2 inch pentagon nut, latch(es) and chains.
 - c. Nozzle threads: National standard hose threads
 - d. Main valve nominal opening size: 4 1/2 inches on mains smaller than 12 inches in diameter, 5 1/4 inches on main 12 inches and larger in diameter.
7. (ADD) **Barrel Extensions:** Solid barrel without threading; only one (single) extension installed per hydrant.

D. Painting.

2. (REPLACE) Above grade exterior coating type will be Safety Red unless otherwise specified by the Engineer.

4150.05 APPURTENANCES.**B. Valve Box.****3. Type.**

a. (REPLACE) Slip (slide) type.

~~b.~~ (DELETE) In all other areas, use a screw extension type.

11. (ADD) Valve boxes shall be centered over the operating nut.

C. Valve Stem Extension.

(REPLACE) Provide as necessary to raise 2 inch operating nut to within 5 or 6 feet of the finish

grade. Stem diameter shall be according to valve manufacturer's recommendations, but not less than 1 inch. It shall also be stainless steel.

D. (ADD) Stainless Steel Repair Clamps.

1. All stainless steel, single section, double section, or triple section, depending upon size of main.
2. Shall have stainless steel bolts and nuts.

2554.01 DESCRIPTION.

- C. (REPLACE) Test and disinfect water mains, valves, fire hydrants, appurtenances and private water services greater than 2 inches in diameter.

2554.03 CONSTRUCTION.

A. Pipe and Fittings.

1. Pipe Installation.

a. General.

- 8) (REPLACE) The use of concrete thrust blocks is not required due to all of the water main being constructed with restrained joints.

6. Tracer System Installation.

- e. (REPLACE) Install ground rods adjacent to connections to existing pipe in native, undisturbed soil and at locations specified in the contract documents or as directed by the Engineer.
- h. (ADD) A minimum of 18 inches of wire slack at every tracer wire terminal box lid shall be installed.
- i. (ADD) Every splice along the tracer wire shall have a minimum of 18 inches of wire slack added to the line.
- j. (ADD) No uninsulated wire shall be installed along any length of run or at splice points. All exposed wire shall be mended as directed by the Engineer, and all splices shall include dielectric grease.
- k. (ADD) Ground rods should be placed 6 to 10 inches from the pipe and not make contact with any part of the water system or any other utility.

7. Conflicts.

d. Surface Water Crossings.

(REPLACE) Comply with the Recommended Standards for Water Works 2012 Edition.

10. ~~Water Service Stub.~~

- ~~b. (DELETE) Install 1 inch and small corporation valves tapped at 45 degrees above the horizontal at a minimum distance of 18 inches from pipe bell or other corporation. Install 1 1/2 inch and 2 inch corporation valves tapped horizontal a minimum distance of 24 inches from pipe bell or other corporation.~~
- ~~c. (DELETE) Construct trench and place backfill material according to Section 2552.~~

B. Valves, Fire Hydrants, and Appurtenances.

4. Adjustment of Existing Valve Box or Fire Hydrant.

a. Minor Valve Box Adjustment.

(REPLACE) For existing adjustable boxes that have sufficient adjustment range to bring to finish grade, raise or lower valve box to finish grade. Valve boxes should be centered over valve operating nut and run straight (not angled).

5. (ADD) Tapped Connections Under Pressure.

- a. Follow manufacturer's installation instructions.
- b. Tapping mains for new connections 1 inch to 12 inch in diameter shall be done by the

Contracting Authority. This includes connections made on public or private mains.

- c. A new and site-specific City tapping application must be prepared for each tap regardless of size and submitted to the Engineer for approval.

6. (ADD) Water Main Operations.

- a. All work which involves operating the active public water distribution system will require the notice, consent, approval and assistance of the Contracting Authority.
- b. An accurate and legible copy of the "as-built" drawings must be on file with the Contracting Authority prior to using the water supply.
- c. If requested by the Engineer, the contractor will work with the Jurisdiction to submit for approval a plan for initial operations and a plan for final operations. The plan(s) shall include a drawing and typed list of actions which show all significant steps necessary to connect to the existing water distribution system or conduct the filling, flushing and testing operations. The purpose of the plan(s) is to minimize the impact of service interruptions, and pressure and flow variations in the water distribution system.

C. Testing and Disinfection.

(ADD) Test and disinfect water mains, valves, fire hydrants, appurtenances and private water services greater than 2 inches in diameter.

1. Sequence of Testing and Disinfection.

(REPLACE) Perform operations according to AWWA C651 in the sequence below. Successfully complete each operation before continuing to the next operation. The Jurisdiction will provide reasonable quantities of water for flushing and testing. All main shall pass bacteriological sampling before pressuring testing. Testing segments shall be no longer than 1200 feet. All legs or laterals shall be tested as separate segments. Water main must pass all testing before any main or service taps are made.

a. Continuous-Feed or Slug Method (After Water Main Installation):

- 4) (REPLACE) Perform bacteriological sampling.
- 5) (ADD) Perform pressure and leak testing.

b. Tablet Method (Concurrent with Water Main Installation):

- 3) (REPLACE) Perform bacteriological sampling.
- 4) (ADD) Perform pressure and leak testing.

3. Disinfection.

b. Procedure.

- 1) (REPLACE) Induce a flow of portable water through the pipe. After 24 hours, a detectable free chlorine residual of A) greater than or equal to 0.2 mg/L for the tablet method or B) greater than or equal to 10 mg/L for the continuous feed method shall be found at each sample point.

5. Pressure and Leak Testing

- a. ~~(DELETE) Remove debris from within the pipe. Clean and swab out pipe if required.~~
- g. (REPLACE) The addition of makeup water is not allowed.
- h. ~~(DELETE) Accurately measure the amount of water required to repressurize the system to the test pressure.~~
- i. ~~(DELETE) Maximum allowable leakage rate according to AWWA C600:~~

$$L = \frac{((S)(D)(P)^{0.5})}{148,000}$$

Where:

- L = allowable leakage, in gallons per hour
- S = length of pipe tested, in feet
- D = nominal pipe diameter, in inches
- P = average test pressure, in pounds per square inch

Table 2554.03-3 assumes an average test pressure (P) of 150 psi and 1,000 feet

of test section.

Table 2554.03-3: Maximum Allowable Leakage Rate

| Pipe Diameter (inches) | Allowable Leakage Rate (gallons/hour/1,000 feet of pipe) |
|------------------------|--|
| 4 | 0.33 |
| 6 | 0.50 |
| 8 | 0.66 |
| 10 | 0.83 |
| 12 | 0.99 |
| 14 | 1.16 |
| 16 | 1.32 |
| 18 | 1.49 |
| 20 | 1.66 |
| 24 | 1.99 |
| 30 | 2.48 |
| 36 | 2.98 |

~~j. (DELETE) If the average measured leakage per hour exceeds the maximum allowable leakage rate, repair and retest the water main.~~

6. Bacteria Sampling.

(REPLACE) Test water mains according to AWWA C651. Repeated failures to produce satisfactory bacteriological results, or if other water quality is affected, will require corrective action up to and including repeating the disinfection procedure or physically cleaning the main as approved by the Engineer.

8. (ADD) System Trace.

All tracer wire terminal boxes shall be to grade, located appropriate distance from hydrant or valve, and with tracer wire correctly attached. The Engineer shall complete a trace to the new pipe(s), including connections to the existing main. Any tracing deficiencies noted by the Engineer shall be corrected and retraced until the entire system traces correctly.

9. (ADD) System Check.

a. Valve Operations: All valves shall be located and tested to verify operation. Remove the valve box lid, insert the valve key and open and close each valve.

b. Hydrant Operations: All valves shall be located and tested to verify operation. Remove the valve box lid, insert the valve key and open and close each valve.

1) After hydrant has been installed and the main and hydrant have been pressure tested, each hydrant shall be flushed and checked for proper operation.

2) After hydrant has been flushed, close it and check for drainage. This is done by placing a hand over the nozzle opening and checking for a vacuum. Then check the hose thread for proper fit.

3) Replace nozzle cap, then open hydrant again and inspect all joints for leaks.

**City of Iowa City Water Division
Accepted Products for Water Distribution Materials
(Revised May 2020)**

WATER PIPE: (Ductile) ANSI/AWWA – A21.51/C151

American, McWane, U.S. Pipe

ATER PIPE: (PVC) AWWA – C900 Pressure Class 150, DR 18

CertainTeed Certa-Lok C900/RJ or C900/RJB for directionally bored or restrained joint piping

RESTRAINED JOINT PIPE GASKET: ANSI/AWWA C111/A21.11

American Fast-Grip, Amarilla Fast-Grip; McWane Sure Stop 350; SRP Barracuda; U.S. Pipe Field Lok 350

MECHANICAL JOINT RESTRAINT DEVICE: With NSS Cor-Blue Nuts & Bolts

EBAA 1100 and 2000 PV; Tyler Union TUF Grip 1000, 1000S, 1500, 2000, and 2000S

FITTING: ANSI/AWWA A21.10/C110 OR C153, 350 psi

Romac Alpha (XL) End Cap, Sigma, Tyler Union, U.S. Pipe

TAPPING SLEEVE: (Full Body Ductile Iron) Stainless Steel and/or NSS Cor-Blue Nuts & Bolts

American Flow Control-Series 2800, Kennedy, Mueller-H615, Tyler Union

TAPPING SLEEVE: (Stainless Steel with 304* Stainless Steel Flange)

Ford FAST, Jeffrey C. Morrow, PE-432, Mueller H304, Romac SST, Smith-Blair 665, TPS Triple Tap Series TS

VALVE: (Resilient Seated Gate Valves) ANSI/AWWA C509, Open Counterclockwise

AVK Series 45, Clow 2640 F-6100, Kennedy 8571 SS, Mueller A-2362-20

VALVE: (Butterfly) ANSI/AWWA C504, Class 150B or Class 250B, Open Counterclockwise

Clow, DeZurik, GAV 800 Series, Kennedy, M & H, Mueller, Pratt Groundhog, Val-Matic

VALVE: (Tapping) ANSI/AWWA C509, Open Counterclockwise

Clow 2640 F-6114, Kennedy 8950 SS, Mueller T-2362-16

VALVE BOX: Slip Type, Heavy Duty

Sigma VB467-35 Top Section with Top Flange, Star Pipe VB-0007; Tyler Union Series 7126, Range 39"-60"

FIRE HYDRANT: AWWA C502, Open Clockwise, 4 ½" (Main Smaller than 12") or 5 ¼" (Main 12" and Larger), with Pumper Nozzle Storz Fitting (integral with 1 ½" pentagon nut and latched)

American Darling Mark 73-5, American Darling B-84-B-5, Clow F-2545 Medallion with all stainless-steel shaft, Mueller Super Centurion 250

STAINLESS STEEL REPAIR CLAMP: AWWA C230, With Stainless Steel Nuts & Bolts

AY McDonald 425/435 Series Teck, Romac SS1, Smith-Blair 261

SLEEVE TYPE COUPLING: AWWA C219, With Stainless Steel Nuts & Bolts

Hymax Coupling, Romac Style 501, Romac Alpha (XL) Wide Range Restraint Coupling, Romac Macro HP Two-Bolt Coupling, Smith-Blair Top Bolt 421, Smith-Blair 441

TRACER WIRE TERMINAL BOX:

Copperhead SnakePit LD14BTP, CD14BTP, RB14BTP

TRACER WIRE CONNECTOR: Blue in Color

Copperhead Industries Snake Bite Locking Connector LSC1230B, Copperhead Industries Direct Bury Single Connector, Twister DB Plus Wire Connector Model 60

TRACER WIRE: #12 AWG, Blue in Color

Copperhead, Kris Tech

FREEZELESS YARD HYDRANT:

Woodford Mfg Iowa Model Y34 and Y1

SERVICE SADDLE: ANSI/AWWA C800

AY McDonald 3845, Ford 202BS, Smith-Blair 325

CORPORATION VALVE: ANSI/AWWA C800, Compression Ball Type

AY McDonald 74701BQ, Mueller B-25008N

BALL CURB VALVE: ANSI/AWWA C800, Compression Connection for CTS OD Tubing

AY McDonald 66100Q, Mueller B25209N

CURB BOX: ANSI/AWWA C800, Arch Pattern, 5-foot Length (Telescope 1-foot), Slide Style with 42" Stainless Steel Rod & Cotter Pin

AY McDonald 5601 and 5603 with 5660SS

CURB BOX LID: "W" OR "Water" Label on Lid

Cement Applications: AY McDonald 5607L

All Other Applications: AY McDonald 5601L

STRAIGHT 3-PART UNION: ANSI/AWWA C800

AY McDonald 74758Q, Mueller H-15403N, Cambridge Coupling

POLYETHYLENE WRAP: AWWA C105, 8 mil

V-Bio Enhanced, approved equivalent